DOCUMENT RESUME

ED 163 975 IR 006 651

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TITLE Technology in Nonformal Education: A Critical Appraisal. Issues in Nonformal Education No. 2.
INSTITUTION Massachusetts Univ., Amherst. Center for International Education.
PUB DATE 76
NOTE 40p.

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Audiovisual Communication; Broadcast Industry; Broadcast Television; *Educational Strategies; Educational Television; Locus of Control; Mass Media; *Media Technology; *Nonformal Education; Radio Technology; *State of the Art Reviews

ABSTRACT

In analyzing efforts to utilize technology in nonformal education programs, the applied communications aspects of instructional technology are most relevant, and locus of control and the technology of educational organization are two major components of analysis. Growing out of these components is the increasing recognition that educational enterprises must become involved in a restructuring of the relationship between education and the setting in which learning is applied, ultimately indicating that organizational technology, and not communication technology, is the dominant concern. The types of educational technology which have been applied to nonformal educational programs can be grouped into four major categories: large scale communications media, small scale communications media, small group instructional technology, and folk media. Broadcast television and radio are the major focus of large scale communications media, while visual media (film and videotape) and audio media (simple cassette recorders) are central to small scale communications media. In evaluation of small group instructional technology, the emphasis is on the distribution of messages utilizing materials which stimulate dialogue among learners and illustrate situations, points, contradictions, and issues. Unlike the others, folk media in nonformal education is a new and relatively undeveloped potential. (JEG)

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TECHNOLOGY IN NONFORMAL EDUCATION

A CRITICAL APPRAISAL

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IR006651

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Printed in the United States of America.

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TECHNOLOGY IN NONFORMAL EDUCATION

(A CRITICAL APPRAISAL)

Since the beginning of the 1960s there have been two innovative movements which have fired the imaginations of developers and held out the hope of placing education in the forefront of development. The first was the use of the mass communications media of radio and television to reach the rural masses with quality education. The second more recent movement, labeled nonformal education, seemed to promise a cheap, effective way of reaching both adults and children outside of school. Both of these movements generated great excitement and hope that at last the problems of education in development could be effectively addressed. Yet as the wave of enthusiasm for nonformal education begins to ebb, the time has come for a more critical appraisal of both the role and the effectiveness of technology in nonformal education.

The term educational technology, or as it is sometimes called, instructional technology, has a wide variety of meanings.[1] The emphasis runs from the traditional focus on electronic hardware, to the programming software and the skills of the teacher, to a more basic definition of technology as the combination of resources in an organizational structure to address specific educational needs. Recently the focus has shifted away from the technology of production and transmission to an emphasis on the practical issues in effectively using educational technology. The term applied communications[2] is being used to denote this newer emphasis.

In analyzing the current state of efforts to utilize technology in nonformal education the applied communications aspects are of course most relevant. Technology can be seen in a more general sense as well and from this perspective, non-

formal education represents a recognition that in designing educational programs in developing countries one should choose an appropriate technology rather than blindly importing the traditional technology of schooling. Here the term appropriate technology is being used analogously to its application in the industrial sector, where the same debate flourishes about the advantages and disadvantages of modern, capital-intensive technology, versus alternative ways of combining capital, labor, and raw materials.[3]

The technology of education in this sense is the choice and manner of combining the various inputs for the educational process: human resources--both trained and untrained, physical resources ranging from texts to electronic hardward, to buildings and the organizational structures which provide the framework within which the educational process takes place. Nonformal education represents a breaking away from the educational technology of schooling. Nonformal education at its most effective is a design process which considers the use of alternate resources combined in alternate ways depending on the setting, the goals of education, and the needs of the particular learners. Specific examples of nonformal education projects usually represent a combination of school and non-school technologies.

Historically the primary emphasis in the area of technology and education has focused on the application of mass communications media first in the formal schools and then in other educational settings. Radio and television provide the primary examples, but as new technology was developed it too was tried out. More recently this has included everything from cassette tape recorders to computer assisted instruction. With increased experience has come better understanding of the strengths and weaknesses of technology in education and a search for less hardware-oriented technologies has begun. Terms such as Small Media and Modest Media[4] were coined to reflect this search. Nonformal education has been particu-

larly active in exploring new technologies of learning and has stimulated experimentation with a wide variety of alternatives, including Folk Media as a source of new educational technologies for use in rural settings.

There are a series of issues which need to be raised in terms of both use and effectiveness of educational technologies in nonformal educational settings. Before proceeding to a fuller discussion of some of these technologies, some of the issues most relevant to nonformal education will be highlighted.

The Locus of Control

In analyzing the characteristics of technology in various nonformal educational settings, one overarching theme emerges which encompasses many of the more specific characteristics. That theme might be labeled "locus of control." Is the primary locus of initiative, problem definition, solution generation, and administrative control at the center in a government ministry or a national organization? Or, is the locus primarily with the users in the village, with the learning group, with a league of campesino leaders, or other local organization? Stated somewhat differently, does the program function primarily in a distributive mode using the media to send centrally produced messages to the learners, or do both the content and the production emerge from the learners and move back and forth between the learners and the central-level personnel in a form of dialogue. Do the materials primarily develop dialogue on the village level, or are they predominantly didactic, intended to teach a specific skill or provide a specific set of answers?

Discussion of issues related to the locus of control is increasingly evident in the literature on the use of various technologies in nonformal education. Recent analyses of the impact of various programs tend to emphasize the sense that the crucial variables influencing the efficacy of a program deal with the locus of problem definition and solution, and with the dialogue versus didactic charac-

teristics of the use of the technology. For growing numbers of nonformal educators the shifting of the locus of control in the direction of the users is becoming a desired characteristic of nonformal education. For some, that dimension is an essential part of the definition of "true" nonformal education, while for others the locus of control is being viewed as essential for effectiveness if not yet a necessary part of the definition.

Associated with the overall locus of control phenomena are a number of subsidiary dimensions worth noting. Logically the first of these lies in the answer to the question of "Who defines the problems and the needs of the learner?" This issue has long been recognized as central in producing effective programming and can be traced back to the procedures in community development programs for determining the felt needs of the people. Much lip service is paid to this principle, and in fact many nonformal educational programs have developed techniques of using surveys, discussions, and feasibility studies to determine the needs and the topics of interest to the learners. The predominant process, however, is still extractive in that the professionals associated with the development of the program gather information and then take it off to their centralized, urban locations for analysis and conversion into programming which is carried, by whatever technology is being used, back to the villagers in the form of a finished educational process. The result is programs that are primarily directive and didactic.

A closely parallel phenomenon is the dominance of both the design process and production activities by highly-paid professionals from either the national educated elite, or the international consultant class. Leaving aside the issue of who tends to benefit from the resources allocated to nonformal education programs when the staff is predominantly composed of highly-paid professionals, the more basic issue lies in the resultant use of international quality standards for production of materials and use of technology. Adhering to these standards effec-

tively closes the door to participation in either design or production by people who are members of the learning group. Professionalism in the pursuit of quality standards derived from highly-developed industrial settings often effectively negates whatever efforts were made to involve the client group in problem definition. Professional standards are often used to justify the use of external personnel because adequately trained nationals are not available. The result is the loss of training opportunities for nationals, and the continued inaccessibility to the control of the technology by those for whom it is utilized.

Control of production processes by professionals naturally leads to the selection of the highest level of professional equipment in order that international standards can be maintained. The result is often the use of very high-cost equipment which requires a whole complex of equally expensive supporting facilities for maintenance and usage. A common example is the insistence on North American studio quality equipment for television to the exclusion of cheap, portable, and easily utilized equipment which produces somewhat lower technical quality. Again the result is the exclusion of all but the most highly trained personnel from using the equipment, and the inevitable restriction of production to studio-level settings. These issues apply to the whole range of technology in nonformal education and not just to the broadcast media. Professional art work, multicolored print layouts, high-speed presses, professional photographers for still photographs, sophisticated programmed instruction formats, complex simulation games, and even puppets and drama are all susceptible to the limiting effects of professional standards and the highly trained specialists needed to achieve them.

Closely related to professionalism is the allocation of resources between hardware and software. Professionally oriented programs devote large proportions of resources to purchase, maintenance and staffing for the hardware. Disproportionately little is spent on programming and user-oriented services that actually

reach out and influence learners. Within the area of software, professional standards lead to very high production costs with little remaining for field activities such as the training of discussion leaders, delivery of supporting materials and the like. Little research seems to have been done to assess the cost/benefit characteristics of less professional production standards in terms of the impact on the learners.

A parallel problem exists in the folk media domain where the issue becomes one of professional quality performance versus participation on a more amateur level. When using puppets or drama to carry a message does one concentrate on developirg a highly trained group of performers who put on a quality show, or does one focus on interactive techniques that engage the learners themselves directly in using the media to express their own thoughts at their own level of capability? Once again the same question arises: is the process to be didactic or dialogical?

The reader will no doubt be able to think of other dimensions of a similar nature, such as the tendency for one set of characteristics to be primarily associated with modern, urban settings while the clientele are largely located in rural, traditional settings. Whatever the specific dimensions of analysis which are appropriate for the particular technology being considered, the overall issue of locus of control will be a central question which must be dealt with.

The Technology of Educational Organization

A second major component of analysis in nonformal education programs involves a set of questions about the choice of human resources to be used and the ways in which they will be combined with each other and with the communications technology being used. This dimension relates to the professionalism issue raised in the preceding section, but is of sufficient importance to be discussed separately. The technology of learning in this sense can be discussed under three general headings: types of learning resources used, selection and organization of the learners, and

relationship between the learning enterprise and the life of the village or community.

The technology of nonformal education is characterized by an expansion in the type of learning resources used in the learning process. Moving away from the trained, certified teacher model of the formal system, nonformal education embraces a wide range of human resources. The various models in operation can be seen as a continuum ranging from the village level animateur, to a facilitator from the village trained to organize learning groups, to the discussion leader or convener of a radio forum, to a literate adult trained to use ministry materials for adult education, to the primary school teacher running adult literacy classes in the evening. The location of a program on the continuum can be seen as representing its distance from the technology of the formal school system. The animateur is more of a village community development instigator than a teacher, whereas the other end of the continuum involves age-graded classes with trained teachers using didactic methods, and represents the formal schooling model in everything but name. The most open nonformal technologies see other learners, and a wide variety of community people as learning resources and seek to facilitate access to such resources and to legitimize their value in the eyes of the learners. Concomitant with the shift away from trained teachers and the use of centrally produced curriculum, is a movement toward content and learning goals which derive from the interests of the learner and are more related to the local situation.

A second aspect of the technology of nonformal educational organization involves the question of who the learners are and how they are grouped together. Nonformal education draws upon a wide range of learners of all ages and with varying degrees of exposure to literacy and formal education. The knowledge and set of life experiences which the learners bring with them can be seen as a major learning resource upon which future learning is to be built, or, as is all too often

the case, the system can tacitly belittle this knowledge as the result of inferior backgrounds which the learning system is designed to overcome. The learning can start from the needs and reality of the learners, or it can be built on needs defined externally. Finally the learners can be organized by sex and age-groups which facilitate the efficient transfer of information to them, or they can be organized in heterosexual, cross-age groups which provide a rich diversity of resources within the group. Nonformal educational technologies are increasingly moving toward the more open options, and are recognizing that the ultimate effectiveness of the process depends more on the involvement of the learner, than on the efficiency with which communications technologies deliver a pre-determined set of messages to the learners.

Growing out of the first two components is the increasing recognition that educational enterprises must become involved in a complete restructuring of the relationship between education and the life setting in which the learners are to apply their learning. Schramm presents a good discussion of this issue under the label of "localizing the School."[5] The most revolutionary approach occurs in societies like Tanzania and China where the structure of the society is changed first, and then the educational enterprises are created to fit into the new form of the society. The Ujamaa villages in Tanzania and the educational activities within them offer at least one model of this approach.[6] More commonly, change is attempted by localizing the curriculum of the school, making the school walls more permeable to issues and people in the community, and broadening the range of learning activities that take place in the school However, such attempts often run into strong opposition from parents and community members. Only when lengthy meetings and discussions are successful in leading to a new set of perceptions of the role of education and its relationship to the life of the community, can the reform of the formal schools be really effective.[7]

Other organizational technologies in nonformal education represent halfway points. Learners may live and work in an environment that functionally combines useful work and learning. Numerous examples of this approach exist including the Youth Brigades in Botswana and Cuba's Escuela en el Campo.[8] Other variations on this model have learners moving back and forth between living/working settings, and educational settings. The Maison Familiale approach in Francophone Africa, for instance, has learners alternating between two weeks in practical work and one week of training. While in most of these examples, the educational component has predominantly formal school characteristics, continued evolution will see new approaches that emphasize more nonformal educational processes.

As will be seen from the following sections, the evidence seems to point more and more toward the importance of the organizational setting in which the communications technology is used as a key factor in determining the degree of effectiveness. Ultimately educators may find that the organizational technology is the dominant concern and not the communications technology which is the primary focus of most of the existing literature.

Four Categories of Technology in Nonformal Education

Using the perspectives developed in the preceding sections, the remainder of the discussion will focus on technology of a more traditional kind. The types of educational technology which have been applied to nonformal educational programs will be grouped for convenience into four general categories. These categories are not meant to be definitive and no attempt will be made to make a comprehensive listing of technologies. Rather, the purpose is to highlight those technologies which have been receiving the most practical attention in field programs, and to analyze the results of those applications.

Large Scale Communications Media

Broadcast television and radio are the major technologies in this category.

In both cases, the initial uses were restricted primarily to formal classroom settings, and particularly for television, application to nonformal educational settings has been fairly recent. For both the standard usage, as well as the argument in favor of the technology, has been one of bringing quality programming generated by a professional staff in a central location to a wide variety of learners distributed throughout a large area. Precisely these characteristics have, at least initially, worked against the effective use of television or radio in nonformal education settings. The handicap is particularly evident where the educational goals place a priority on participation, on localization of material, and on the internalization of the learning for use in the learner's personal situation.

Even today the primary use of television in nonformal education is one of supplementing the dominant use as a commercial broadcast facility or as a system designed to bring televised curriculum to the formal classroom.[9] These two basic situations result in part from the cost and complexity of installing production and transmission capability. Supplementing broadcast television usually takes the form of general cultural programming of opera, ballet, classical music or other cultural events. This type of programming is not usually supported by any other infrastructure designed to provide further interaction with listeners. Such programming may have advertising and other promotional efforts in newspapers, and occasionally it may be supplemented by written material available if listeners write in to request it.

A second form of educational broadcast television is more structured and is often related to university courses for adults.[10] These range from open broadcasting of series on everything from language learning to science, to structured courses that are part of a university extension service for which participants can get credit. The open broadcasts are used by individuals at their own discretion

and with no further supporting structure. The credit courses have varying degrees of structure ranging from regular correspondence material which is sent to the university, to tutorial groups that meet periodically, to published text material which is available either by purchase, or occasionally through supplements in popular newspapers. Both forms of open broadcast education have been fairly successful in relatively developed settings.

The limitations of these models for nonformal education are fairly obvious. They depend on the infrastructure, namely production, broadcast and reception facilities already being in place. They tend to reach an already well educated audience, and generally have only limited effectiveness in reaching the economically disadvantaged or the culturally different, even in highly developed settings. In addition the educational format is heavily didactic with little or no dialogue or participation on the part of the viewer. Thus, experience so far would indicate that these forms of television education have very little potential for reaching the priority audiences for nonformal education, particularly in the less-developed countries of the world.

The other dominant use of television for nonformal education occurs where large-scale classroom television facilities have been installed. The well-known examples in the past decade include Colombia, American Samoa, El Salvador, and the Ivory Coast.[11] In each of these cases some secondary efforts have been devoted to extending the use of the facilities to adult education outside of regular school hours. In most cases this involves setting up classes of adults who come to the school to watch television and receive varying degrees of supervision and help from teachers who add this responsibility to their regular teaching load. While in theory fairly effective educational activities might be undertaken this way, in practice the supplementary nature of the effort means a low priority in the assignment of resources and particularly in the amount of energy and skill which

a classroom teacher will have available for this added task, for which there is rarely any added compensation.

Educational methods remain highly didactic, with the television providing programming quite similar to that produced for the classroom. Predictably the teachers behave in much the same way as they do in school, since that is their career and involves thoroughly ingrained behavior patterns. The potential for reaching needy non-school audiences is better than in open broadcasting, but still limited to the more accessible parts of a country and often to the better developed sections, since those are the areas most likely to receive educational television for their schools. Finally, although the marginal costs of such supplementary adult education are small, the probable impact is also small. The cost necessary to reach the genuinely needy audiences would be prohibitive and will remain so until there is widespread installation of transmission and reception capability for other reasons.

Although the dominant models for use of television for nonformal education are not very promising, there are a number of noteworthy small-scale projects that indicate some of the potential.[12] Two worthy of brief mention are the Krishi Darshan program in India, and the teleclubs of Senegal.[13] In both of these cases the programming and the organization were specifically undertaken to reach the target audience and were not supplementary to an ongoing educational television project. The Indian program focused on about 80 villages near New Delhi, in each of which viewing groups were formed to watch programs related to rural development. Of the various problems cited in evaluation, the lack of an entertaining format, and the low credibility of programming due to the use of educated urban people on the screen, seem to have been the most serious drawbacks. The locus of control in this project was clearly in the capital city, and the problems cited would seem to be a predictable result of that.

The experience of Senegal seems to have been more successful, with considerably more attention being paid to the human organization needed to form the teleclubs, which in this case were for urban women, and the type of training and support which leaders of these clubs needed to be effective. Programs moved away from the didactic teaching style and attempted to present visual material that would stimulate discussion and dialogue based on the local reality of the viewers. Care was taken to field-test reactions to programming, and some thought was given to the level of visual literacy of the viewers. The project was limited to a small pilot phase and therefore the evidence of the feasibility and practicability of a larger scale application was not explored. Although the impact on the viewers seems to have been successful, the economic feasibility of television which depends on truly large audiences in order to bring the unit cost down to acceptable levels remains a serious drawback to such a model.

A recent full-length study of the use of television for nonformal education[14] closes with a series of guidelines, some of which are worth repeating here. The author suggests that: (1) television will be secondary to radio in appropriateness for most nonformal educational projects; (2) that television should be restricted to settings where the medium is already present, which means primarily urban settings; (3) broadcast of film and video-tape made from cheap portable apparatus is the most cost-effective route for nonformal educational programming; (4) television should be used to facilitate communications between rural areas and urban areas, with the emphasis being on educating urban-based decision makers about the needs and reality of the rural area; and (5) that television should develop a much more even balance between professional production of messages reflecting institutional needs, and participatory communications reflecting the needs of individuals and local communities.

Where there does seem to be a potential role for television, it lies more

in the localized use of the media in the form of film and video-tape than in the area of large scale broadcasting. The last three recommendations reflect this emphasis, and are worthy of further discussion. Since the use is more characteristic of small-scale visual media, more detailed discussion will be deferred to the following section. The remainder of this section will focus on large-scale uses of radio as the mass medium which is more likely to be the technology of nonformal educational projects.

Schramm highlights the general feeling of many authors about the role of radio in nonformal education with his comment: "If there is a medium for nonformal education, it is radio."[15] He supports this with data on the widespread availability of radio even in the poorest sections of the world. However, he also quickly supplements this point with comments about radio having limited effectiveness unless used in conjunction with other types of materials. A very good summary review of the use of radio in development by McAnany[16] serves to emphasize strongly the central importance of the technology of organization or educational resources in nonformal education. He divides the use of radio for development into five categories which might be simplified into just two categories: open broadcasting, with no effort to interact with the listeners, and broadcasting to organized groups with a variety of characteristics. A simple way of stating the difference would be to distinguish between the unorganized audience of open broadcasting and the organized audience present in the remaining four types of groups.

The four types of organized listening groups discussed by McAnany can be roughly placed on a continuum where the locus of the control shifts from a centralized formal school setting to a fairly participative format where the locus of much of the effort is in the listening group. The first category, instructional radio, located primarily within schools, is the most didactic and is characterized by a centrally designed and implemented curriculum. The technology of organization in

this category is primarily that of schools, with trained teachers, texts, written exercises by the learners, and so forth. Little or no localization of approaches or problems takes place in this type of model. If anything, the centralized televising is consciously used to reform the system by providing a new curriculum which is received everywhere simultaneously. This model basically treats all learners as equivalent and functions to standardize the education provided to all learners throughout the system.

A second major category is that of the radio school, typified by the often discussed and widely copied[17] Accion Cultural Popular (ACPO) program in Colombia. These radio schools are characterized by organized groups of listeners directed by a trained leader. The primary content emphasis is on basic adult education backed up by written text materials, often a rural newspaper, and a well-organized system of supervisory staff. The more extensive programs are excellent examples of multi-media approaches which supplement the radio broadcasts with a variety of visual and written materials and periodic national campaigns. The radio school is characterized by its closeness to the primary school curriculum, by its intensity, and by having structured and sequenced content which takes learners through a hierarchy of knowledge skills.

The radio school model, sometimes called the study group approach, has some basic contradictions between commonly stated goals and the methodology employed. On the one hand the radio schools function as a basic educational mechanism to provide adults with literacy and numeracy skills through a fairly didactic study group process, while on the other hand they seek to create a "new man" by motivating the campesino to participate in development, by integrating this new man into society, by the organization and development of the community, and by the spiritual development of the campesino. Fairly clearly the behaviors and learning experiences associated with these goals are at best unlikely to be promoted by a study group

whose internal functioning resembles a quasi-school organizational technology. While it is true that the ACPO model does involve other kinds of activities promoted through the newspaper, through regional training centers, and through various community action campaigns, the basic methodology remains the network of study groups. Equally clearly, the locus of control remains highly centralized with curricular content and sequencing of topics located primarily in the hands of the professional staff at the central headquarters.

A third category of radio usage in nonformal education--the rural radio forums which are sometimes called discussion/decision[18] groups--have a long history originating in Canada at the time of World War II and then being extensively applied in India. The basic model consists of a group of villagers who meet once or twice a week to listen to a radio program and then discuss its contents. A typical program would contain a presentation on some topic such as the use of fertilizers, as well as questions and answers derived from a discussion in a previous week. The group would typically be composed of the better educated members of the village and the convener might be the village leader or someone from the village who had received some outside training. Depending on the particular leader and the design of the program, after the listening session there would be a discussion and in some cases a decision to take some particular local action related to the topic under consideration.

Schramm reports on the fairly extensive efforts to evaluate the impact of such radio forums.[19] The major sources of impact seem to be the group discussion after the broadcast and where present, the public commitment of both individuals and the group to take some action after the discussion. To the extent that meaningful decisions are taken and people make public commitments to them, this model represents a significant shift of the locus of control toward the learners. Even though the topic and the presentation are still largely in the hands of the central-

ized producers, there is an opportunity for localization, and the autonomy to proceed or not with relevant local action. The weakness lies in the relative absence of commitment to the importance of the problem and the ability to analyze for oneself the sources of problems in the village. The decision may take the form of minor treatment of symptoms rather than an understanding of underlying causes and the treatment of those. Other problems include a tendency for this model to involve primarily the relatively more educated elite, and the lack of meaningful integration with key agencies responsible for the inputs needed for rural development.

The fourth category is often linked to the term animation and might be called the discussion/participation group. The animation strategy grew out of a French tradition of group dynamics and has been applied extensively in Francophone Africa as well as influencing Freire and the approach which he developed originally in Brazil. The basic technique involves the development of a trained cadre of discussion leaders who promote a non-directive dialogue in their communities which leads to the villagers defining their development problems for themselves and putting these problems in the larger context of their society. The final step is mobilizing the members of these communities to take common action to overcome the problems. The major distinction between this category and the previous one is the shift of the locus of control of problem definition from the center to the community itself.

The role of radio in this category is sometimes secondary or supplemental. The major thrust lies in the group process initiated by the animateur in the community. The radio may supplement this process, provide encouragement, give visibility to the efforts of similar communities, and generate a sense of larger solidarity throughout a region. But the effectiveness depends not on the radio, but on the success of the process within the community groups. The radio is a re-

porting device that should function primarily on the basis of material generated by the discussion groups. In practice the locus of initiative will depend on the effectiveness of the community groups and on the degree of awareness on the part of the central staff of the essential nature of community-based problem definition. Pressures to produce programming, or lack of commitment to the model can lead to a shift in the control to the programmers at the broadcasting studio. The essential aspect of this model is the focus on community problem definition rather than central dissemination of information on a problem defined by experts. Feedback from communities is not an extra, but the core of the process of developing the programming. Examples of these programs include the radio clubs in Niger, and the Movimento de Educacao de Base in Brazil. Significantly, the use of radio in the latter program emerged after a process of social mobilization had led to the formation of rural leagues and was a response to a community-defined need, in this case literacy instruction, rather than a service to meet a presumed need.

This first category has been discussed more extensively because it provides a clear illustration of the basic premise of the paper. The relationship between the technology of organization and the communications technology is the key to the effective use of technology in nonformal education. The different radio strategies highlight this in a most instructive way. The major differences between all five categories lie not in the production and distribution of the radio programs, but in the human organizational structure within which the radio is used. The structure in turn, strongly influences the characteristics of the learning process which takes place. This relationship will be even more apparent in the technologies discussed in the next section.

Small Scale Communications Media

Included in this category are the visual media of film and video-tape and

the audio media of simple cassette recorders. This category contains some of the most creative and promising uses of communications technology which may be indicators of the future. At the moment all of the examples are of a small-scale pilot nature. In many ways, they highlight some of the contradictions between community controlled, process-oriented educational methods and the centralized, mass-user characteristics of the communications technology.

In terms of their use for nonformal education, one can discuss both film and video-tape in the same context. Their use for nonformal education grows out of relatively recent technological developments in both fields that make reasonably priced, easily usable equipment available to non-professionals. Early equipment produced quality that was substantially lower than professional results, but more recent advances have made possible the production of quite acceptable, visual materials without resort to either professional equipment or the skills of highly-trained professionals. In video-tape this means the use of portable 1/2" and even 1/4" recorders, and in film the use of Super-8 cameras with or without synchronized sound recording.

While the new technology made on-the-scene filming possible at a reasonable cost, more important was a change in the philosophy of the role which such visual recording could play in a community. Previously, film and television had been used almost exclusively in an extractive manner. A professional would make a visual record according to personal professional and artistic standards. The community would merely provide the raw material for the record and would play no other part in the process. Often the community would be very dissatisfied with the result, feeling that they were misrepresented or that substantial distortion was present.[20] The professional didn't care since the goal was to please a different audience, and to transmit a message from a personal perspective rather than to represent the community's point of view.

Starting from this point, a series of experiences, particularly on the part of filmmakers involved with the Canadian National Film Board, led to the evolution of a wholly different process which might be labeled participatory film making. In such a process both the goal and the process change. The goal is to allow the community to use the visual media to articulate and clarify their own points of view, and then to move on to an agreed upon definition of community issues and problems. At that point, after much dialogue, the process may produce a product that is used to convey the community perspective on problems to regional and central government officials in a powerful and effective manner. The primary goal is thus dialogue within the community, and secondarily dialogue with higher level officials whose decisions directly influence the situation in the community.[21]

The production process which leads to such a goal is radically different from that normally used to produce a film or video-tape. The major characteristic of the process is the transference of the locus of control almost completely to members of the community. Community members control the key steps of: (a) deciding on the location, setting and topic for any filming being done; (b) viewing all raw footage or tapes and expressing an opinion about what needs to be added or deleted; (c) actively participating in whatever editing is done; and (d) approving any product that is used outside of the community. In the case of video-tape, community members do much of the actual taping after short training by the professionals. The primary goals are visual statements which community members view as accurately representing them, dialogue based on viewing these segments and discussing the points of view represented, and the eventual piecing together of a product which the community feels conveys adequately their own definition of the problem and their recommended action.

The description in the preceding paragraph can be regarded as an ideal model which has been applied in its entirety infrequently. Perhaps the best known

example is that of the Skyriver project in Alaska in an eskimo community.[22] Lesser known examples which involved varying degrees of community participation include a UNESCO sponsored project in a series of Ujamaa villages in Tanzania and a community action project in the Peruvian village of Mateo Pumacahua.[23] In all these cases, the basic technology used was the portable video-tape recorder and some sequence of village participation in constructing a visual set of statements which were used as a stimulus for a dialogue within the community. In all cases the major product was the awareness produced by the dialogue in the participants themselves.

In terms of the criteria discussed at the beginning of the article, these examples represent a deprofessionalization of the use of communications technology so that the professional skills become tools for use by the participants, rather than specialized activities restricted to professionals. Consequently the locus of control passes largely to the community and results in a form of nonformal education which places a premium on personal and community growth. The resultant process has a significantly enhanced probability of producing learners who are able to apply their learning to their own lives.

A parallel development of technology in the audio recording field has opened up similar applications for nonformal education. In this case the availability of relatively cheap, reliable, battery-powered tape cassette recorders has stimulated the development of their use in increasingly creative ways. The same issues of professional quality and locus of control can be seen in these applications as well.

One useful example bridges the gap between centrally produced broadcasting in radio schools and the desirability of having listeners produce their own programs. A small radio school in Tabacundo, Ecuador, was the setting for a simple project.[24] A group of about forty listening groups were each provided with a

cassette recorder. The group leader was given several hours of simple training in the use and maintenance of the recorder. Pressure from educational specialists to teach them what to record and how to go about it were successfully resisted and the leaders were sent into the communities to tape what they chose. Over a period of nine months remarkable changes took place in what they recorded, the quality of the recording, and the impact on the radio school which had agreed to broadcast excerpts from tapes produced by the listeners. The amount of broadcasting based on the tapes steadily increased, and the content moved from music and entertainment, to interviews with government leaders, to dialogue on significant community issues. Although the locus of control over what was broadcast on the radio remained in the hands of the local producer, he was responsive to listener demands.

Another set of uses for the cassette recorders has been developed which are more distributive in nature, but which offer the listener at least some control over the situation in which the listening takes place. Pre-recorded messages on health, nutrition, or farming practices are combined with portable tape players and extension workers to form an information distribution network. The recorder can be used in a listening group, as in a radio school setting; it can be used as a training device for para-professionals when the needed manpower is not available; and it can be used by the field extension workers in different ways as they make their visits. Some of the advantages of such an approach include the extension of the effectiveness of the field worker because more families can be reached and because accurate technical information can be presented on the tape without having to rely upon a clear explanation from the field worker. Messages and style of presentation can be tailored to the local situation since the production cost of tapes is low. The tapes and machine can be left with a family to repeat and to share with friends and neighbors.

Experience in a variety of settings around the world indicates that such a procedure is feasible, and that increased effectiveness does result. Colle reports on many of these usages in a series of papers which outline the various patterns of usage.[25] As currently used, the locus of control remains primarily in the hands of the producer and the extension agents. Yet there seems to be a relatively low level of emphasis on high professional quality production, and a willingness to recognize the value of using local speakers and situations on the tapes. There seems to be little effort so far to take the next step which would involve having users themselves make tapes to share their reactions and their statements of the problems. In some projects, self-recording is not possible because of the use of play-only machines. Even without this component, the existing uses reflect the importance of different organizational technologies in making use of the communications technology.

Small Group Instructional Technology

Although this section should logically include the wide range of traditional audio-visual aids so familiar to classroom teachers, no attempt will be made to discuss them in this document. Many of them, particularly those which are non-electronic and don't require scarce materials, can be effectively used in nonformal educational settings. Planners should beware of assumptions about availability of such things as chalk, chalkboards, large pieces of paper or posterboard, felt-tip pens and so forth in rural areas of developing countries. Such things are rarely available in any quantity within schools, and are much less likely to be present in nonformal educational settings. As in all technologies, the key to effectiveness lies in the manner in which such material is used. The emphasis can be on distribution of messages and didactic teaching-learning process, or the materials can be used to stimulate dialogue among the learners and to illustrate situations, points, contradictions, and issues arising from the local environment. In this

section a brief look will be taken at a few innovative approaches to the use of such materials in nonformal educational settings.

A common technique in the Freirean approach to consciousness raising through literacy is the use of pictures or sketches. Typically these depict scenes from the local setting which contain some aspect of contradiction; for instance, the large hacienda of the landowner in the background with small campesino houses in the foreground. What form should such pictures take when produced for use in a project? Instead of expensive production on hardboard, a cheaper and more flexible alternative is to use large newsprint reproductions which roll up easily for transport, and which have very low per copy cost. Lacking that, a sketch on a blackboard or even a line drawing with a stick on a piece of smooth ground will do. Although attention tends to focus on the technology of printing the picture, the crucial technology is the process of stimulating and drawing out the dialogue in a productive way.

Realization of the difficulty of using traditional instructional technologies in ways which were participative and promoted dialogue rather than in ways which were didactic and promoted passive listening, led to the attempts to develop a new class of materials for rural nonformal education. One result of this search was the development of a technology for dialogue based on the use of simple games and simulations. Stimulated initially by the writings of Freire, a group of Ecuadoreans and North Americans have developed and used a wide range of such materials in rural Ecuador. Smith argues that games provide a practical way of implementing the pedagogy advocated by Freire.[26] Games serve to pose a problem based on an abstraction of the real world. The learner must take a role, infuse it with his own life experience, act on his own behalf, and learn to see himself as having some control over the outcome of events, at least in the limited context of the game.

Games also serve to transfer the locus of activity from the teacher to the learner. Once successfully begun the locus of dialogue and the search for understanding lies within the group of players and their interaction. The role of the leader is transformed into posing questions and facilitating analysis after the play of the game has ended. This is a difficult task to do well without the leader imposing his or her own position. In the long run the capability of the facilitator is the key to much of the effectiveness of the gaming approach. These abilities are not necessarily to be found in the formally educated, and in fact the experience of the project in Ecuador suggests that the most effective facilitators are members of the village who have participated in special training sessions.

Gaming materials for nonformal education can be conveniently divided into three classes: fluency games, role playing games, and simulation games.[27] These classes are not mutually exclusive, but can be used to group materials by their dominant characteristics. Fluency games are like the common instructional games used for simple skill training in many elementary school classrooms. Their purpose is to provide entertaining ways to practice simple skills in numeracy and literacy. In a rural setting they help to promote a sense of confidence as villagers cope with market mathematics or learn to recognize letters and form basic words. Fluency games usually consist of dice or cards, but others use devices such as a simplified pin ball machine, roulette wheels or even a ring toss. Often a good strategy is to look for traditional games which can be modified by adding numbers or letters to provide skill practice. Fluency games are characterized by simplicity of form and by flexibility in ways of use so that the same format can teach a variety of related skills and can be used in an almost infinite variety of ways.

Role playing involves villagers in acting out different situations common to their everyday life. Goals are twofold: to provide experience in taking roles

which would otherwise be inaccessible to them in real life, and to allow them to work out alternative scenarios to their normal behavior in common situations. In a rural setting, a tenant may take the part of the landowner and play through a sequence of trying to collect the rent from another tenant. Such activity stimulates discussion, provides a way to present critical issues in the life of the community, and can lead to a clearer understanding of the forces which shape their lives. The resulting socio-drama is also entertaining and serves to attract people and motivate them to participate. One device used to enhance this effect in rural Ecuador was the creation of cabezones,[28] large papier-maché heads which people put on when taking various roles. For many rural societies this form of entertainment is part of a tradition, and people participate easily with little or no scripting necessary.

Finally, role playing can be placed in the more structured context of a simulation game. Simulations create life-like situations drawn from the life of the villager but presented in a condensed and more manageable form. Time is foreshortened so effects of long-term cycles in agriculture can be understood, major forces causing problems in the community are dramatized, and complex reality is simplified to promote analysis and understanding. Simulations allow communities to deal with issues indirectly which might otherwise be too explosive to discuss. In a game called El Robo (theft), for instance, the players attempt to analyze the cause of the disappearance of money from the cooperative. Discussion of the issue and even accusation of guilt directed at certain roles is possible. And, of course, the similarity to parallel situations in reality doesn't go unnoticed.

The most effective simulations seem to be ones which set up a basic framework into which the players can inject the reality of their own lives. The rules are relatively unimportant and should be freely modifiable by the players. In contrast to the usage of games in a North American context where the object is to play

by the rules and compete to win, the purpose of gaming in nonformal education is to allow people to recognize problems, analyze them, and begin to learn new behaviors to cope with them. Simulations provide low-threat situations for practicing new behaviors such as borrowing money and understanding the concept of interest.

While games are just one of many instructional technologies, their characteristics of high motivation, entertainment, high degree of participation, cheapness--often being locally producable, and flexibility, make them particularly effective in nonformal educational settings. When combined with a good facilitator trained in the use of dialogue methods, games can provide a powerful tool for both skill training and for problem solving. The locus of control can be largely in the hands of the participants, and when successfully used can result in a powerful consciousness-raising for the learners. Many other instructional materials are potentially usable for similar goals, but they require greater knowledge and skill on the part of the leader who must provide for the participation and interaction which games generate naturally.

Folk Media

There has been a recent upsurge of interest in making use of folk media to transmit development messages and as a vehicle for nonformal educational programs.[29] Traditional drama, song, dance, puppetry, and storytelling have all been the target of exploratory efforts to use what has been called the "expressive culture" in the development process. Sometime the folk media are seen solely as transmitters, while in other programs an attempt is made to integrate such activities into larger education and action contexts.

From the perspective of the communications specialist, folk media have a number of attractive characteristics that would appear to make them ideal for bridging the gap between the individual learners and the modern, impersonal mass media. Folk media are characterized by a high degree of credibility with their

audiences, they are well accepted, have long-established histories, have many forms--some of which traditionally include improvisation and the inclusion of topical messages--and they provide a link between modern and traditional cultures. Folk media are an interpersonal communications channel which makes them potentially powerful molders of attitudes and behavior. Folk media also serve to interpret the unknown, to provide spiritual guidance, and to assist a community in merging new practices with existing beliefs and structures.

Many recent attempts to use folk media have occurred in Asia, a region which is particularly rich in folk traditions which remain active today. Rogers cites numerous examples where family planning education has made use of various traditional art forms. These include the ludruk theater of Java, the wajang kulit shadow theater, singing storytellers in India, village theater and ballad singing in China, and puppets of many different kinds throughout Asia, to name only a few.[30] Other regions of the world can provide similar examples both in family planning education and in other content areas.

As interest and experimentation in the use of folk media grows, voices of concern are also beginning to be heard. Juan Bordenave articulates a number of issues about the possible negative consequences to the culture of the people if their folk media are subverted into instrumental roles at service of developers.[31] He and others argue that folk media are an essential part of the maintenance mechanism for many cultures and that the result of misuse could be the discrediting of traditional performers, a cynical realization that folk traditions were being taken away from the people, and ultimately in cultural genocide. While many writers would not go that far, there are clearly ethical issues which must be raised and faced. The current communications literature contains little discussion of these issues in the use of folk media.

From the perspective of technology in nonformal education, several points

can be made. Traditional folk media are in one sense the essence of nonformal education, in that they are indigenously created educational processes whose message and style is totally controlled by the people. The content is modified to fit the issues of the moment as well as to socialize members of the society into abiding by the dominant cultural norms. But when such a medium is used as a means for communicating a message generated by planners in a central ministry, the locus of control shifts abruptly to others, and the learners become inactive recipients. What remains is a traditional vehicle carrying modern and often foreign content.

In contrast to using fully traditional forms of folk media to carry messages, a number of educators have experimented with creating new processes which use similar technology, but whose style and content is an amalgam of old and new. Thus drama and puppets can be used to carry messages, to stimulate dialogue, and to motivate communities. Although a traditional vehicle such as puppets is being used, the style, the people using the puppets, and the messages are distinct from purely traditional formats. In using these vehicles, nonformal educational projects tend to move away from the performance mode and into a more participative style. The purpose of the activity is to engage the community in active participation rather than to put on a polished performance of a more professional nature.

Examples of this style use of folk media include a wide variety of drama presentations such as the "Drama for Progress" theater in the Jamaican Literacy Campaign, and the well-known El Teatro Campesino in the United States. Both of these cases combine an awareness-raising and motivational component with an attempt to incorporate the local needs, issues, and even the local dialect into the theater. More recent development of this approach involves moving even further away from professional performers, to incorporate the use of local people in the actual performance. The major goal is to get community members to express themselves through drama, puppets, or song on issues of importance to them. The performance becomes

a device for involving people, for dialogue among themselves as to what their problems really are, and as a stepping stone to group action to address their problems. Professionals are involved not as performers, but as facilitators whose task is to help others clarify their thoughts and then express them in the medium of their choice.[32] The locus of control shifts entirely to the participants for both content and mode of expression.

The use of folk media in nonformal education is new and relatively undeveloped. The future will bring increased experimentation and even more creative combinations of traditional communications technologies with processes which help rural people cope with the pressures which are changing their ways of life. With luck the diversity and richness of traditional media will stimulate new forms that are effective in nonformal education as well as surviving as a live cultural force in their more traditional form.

The Future of Technology in Nonformal Education

The issues raised by the discussion in the four categories above will likely provide the framework for future development of the use of technology in nonformal education. Perhaps the most basic issue is the emerging importance of the organizational technology as the key to the effective use of communications technology. For the kinds of educational goals that often characterize nonformal education, the need for localized, participatory, and learner-controlled mechanisms provides a strong challenge to communications media originally developed primarily as a means of large-scale distribution of centrally produced messages. The creation of effective local organizational structures to take input from mass media, and possess it for themselves, will continue to be the dominant thrust in future design efforts. While initially this contradiction caused a turning away from the large-scale media, there now seems to be a sense that a combination of large media with appropriate local organization can provide a powerful nonformal educational learning

model.[33] The resurgence of interest in radio is evidence of the belief in that possibility.

A second major thrust is the deprofessionalization of the equipment, the production process, and the personnel needed to apply technology to nonformal education. Technical advances in machinery coupled with better understanding of what produces effective utilization has led increasingly to a participatory mode not just for reception, but for conceptualization and production. Creative examples of the participatory approach are now numerous, but still tend to be in small-scale pilot programs. The future will hopefully see an expansion of these models to larger scale applications. Included in this deprofessionalization is also the use of the fine arts as a communications technology drawing on traditional formats, but applying them in new ways. Here, too, the emphasis is beginning to shift from professional performance to self-expression by the participants. The shift of the locus of control from the central producer to the local user parallels the growth in self-reliance, personal problem solving ability, and Freirean style conscientization as educational goals for rural development. Technology will increasingly be used in ways that promote those kinds of outcomes.

Finally, the future will see greater use of combinations of communications technology in complementary ways as nonformal education seeks to provide the variety of inputs necessary to promote human development. Just as rural development is now seen to require an integrated approach across many sectors, nonformal education will use both communications and organizational technology in ways that support a full range of development objectives. Programs built around a single communications technology will give way to integrated programs using a range of technologies which will reflect an improved balance between centralized institutional needs and the goals of individual learners who seek to control the future direction of their lives.

FOOTNOTES

1. J. W. Armsey and N. C. Dahl, An Inquiry into the Uses of Instructional Technology (New York: The Ford Foundation, 1973). See pp. 1 - 5 for a discussion of various meanings of the term instructional technology.

2. Andreas Fuglesang, Applied Communication in Developing Countries, Ideas and Observations (Uppsala: Dag Hammarskjold Foundation, 1973).

3. See for example the discussion on the definition of the term "appropriate technology: in Sarah Jackson, Economically Appropriate Technologies for Developing Countries: A Survey (London: Overseas Development Council, Occasional Paper #3, no date), pp. 1 - 7. For her, the choice of an appropriate technology depends on an exploration of feasible alternative combinations of inputs, the comparative financial returns to those technologies, and the entent to which factor prices reflect the relative scarcity of those factors in the economy. Such an approach is more than a little relevant for education where the major limiting factor is the cost of teachers. See also E. F. Schumacher, Small is Beautiful (London: Abacus Edition of Sphere Books Ltd.,1974), pp. 143 - 160.

4. See for instance W. Schramm, Big Media -- Little Media (Washington, D. C.: Academy for Educational Development, 1973) and also Jonathan Gunter, "Modest Media," (Amherst, Massachusetts: Center for International Education, University of Massachusetts, lithographed, 1975).

5. Schramm, Big Media -- Little Media, p. 259 ff.

6. For an extensive analysis of nonformal educational programs in Tanzania see Arthur Gillette, Beyond the Nonformal Fashion: Towards Educational Revolution in Tanzania (Amherst: School of Education, University of Massachusetts, doctoral dissertation, 1976).

7. For a discussion of this process in a setting Chad see Schramm, Big Media -- Little Media, p. 262 - 266.

8. Arthur Gillette, Cuba's Educational Revolution (London: Fabian Research Series #302, 1972), p. 26 ff.

9. For a good collection of articles on the use of television in development see Robert Arnove, (ed.) Educational Television: A Policy Critique and Guide for Developing Countries, A report to the Ford Foundation (Stanford, California: School of Education, Stanford University, unpublished, May 1973).

10. For a discussion of non-school uses of television in Canada, Czechoslovakia, and Japan see Brian Groombridge, (ed.) Adult Education and Television: A Comparative Study in Three Countries (London: National Institute of Adult Education in collaboration with UNESCO, 1966).

11. For a good comparative discussion of these programs see chapter V in Schramm, Big Media -- Little Media, pp. 111 - 167. His discussion focuses primarily on the in-school component of these projects, and on the use of television for reform of the educational system.

12. An extensive bibliography of relatively scarce references and a good summary discussion can be found in H. T. Ingle, Communication Media and Technology: A Look at Their Role in Nonformal Education Programs (Washington, D. C.: Academy for Educational Development, Inc., August 1974), pp. 12 - 15.

13. See Pierre Fougeyrollas, Television and the Social Education of Women (Paris: Reports and Papers on Mass Communication No. 50, Department of Mass Communication, UNESCO, 1967) and Henry Cassirer, Mass Media in an African Context -- An Evaluation of Senegal's Pilot Project (Paris: Reports and Papers on Mass Communication No. 69, Dept. of Mass Communications, UNESCO, 1973).

14. Jonathan F. Gunter, NFE-TV: Television for Nonformal Education (Amherst, Massachusetts: Center for International Education, University of Massachusetts, 1975), pp. 265 - 276.

15. Schramm, Big Media -- Little Media, p. 253.

16. Emile McAnany, Radio's Role in Development: Five Strategies of Use (Washington, D. C.: Academy for Educational Development, Information Bulletin No. 4, September 1973).

17. Ibid., pp. 14 - 15, provides a detailed chart of more than twenty-five radio schools in Latin America which inspired by the ACPO model.

18. In the characterization of these groups the author has combined schemes used by Schramm and McAnany in order to provide greater clarity in describing the characteristic modes of activity within the listening groups.

19. Schramm, Big Media -- Little Media, p. 280.

20. Gunter, NFE-TV: Television for Nonformal Education, p. 208 ff. provides several examples of the negative impact of films made without letting the individuals portrayed in the film participate in the editing or having an opportunity to view the films before they were broadcast.

21. For a discussion of these issues from the point of view of a variety of film-makers see "Film in Development" an issue of the ICIT Report, No. 14, (April 1976).

22. For a detailed presentation of the Skyriver project see Gunter, NFE-TV: Television for Nonformal Education, pp. 197 - 232.

23. A good review of the use of video taping in rural development is included in Ingle, Communications Media and Technology, pp. 18 - 25.

24. James Hoxeng, Tabacundo -- Battery-Powered Dialogue, Technical Note No. 10 (Amherst, Massachusetts: Center for International Education, University of Massachusetts, 1976).

25. Royal D. Colle, Cassette Special Communications Systems, a set of five papers (Ithaca, New York: Cornell University, lithographed, 1975).

26. William Smith, Conscientizacao and Simulation Games, Technical Note No. 2 (Amherst, Massachusetts: Center for International Education, University of Massachusetts, 1972).

27. For a discussion of the overall project setting as well as the criteria used in creating various types of games see David R. Evans and James Hoxeng, The Ecuador Project, Technical Note No. 1 (Amherst, Massachusetts: Center for International Education, University of Massachusetts, 1972).

28 Nonformal Education in Ecuador 1971 - 1975 (Amherst, Massachusetts: Center for International Education, University of Massachusetts, 1975), p. 99. This reference also includes extended discussion of the gaming techniques as well as the training process for facilitators.

29. "Folk Media in Development," an issue of Instructional Technology Report, No. 12 (September, 1975).

30. See discussion in Everett Rogers, Communication Strategies for Family Planning (New York: The Free Press, 1973), p. 284 ff.

31. Juan Bordenave, "The Role of Folk Media: A Point of View," in Instructional Technology Report, No. 12 (September 1975), p. 4.

32. See for example Robert Russell, "The Fun Bus" (Amherst, Massachusetts: Center for International Education, University of Massachusetts, lithograph, 1976).

33. The Tanzania radio campaigns may provide a good example of emerging models. For a good discussion see Budd Hall and Tony Dodds, Voices for Development: The Tanzanian National Radio Study Campaigns (London: International Extension College Broadsheets on Distance Learning, No. 6, 1974).